Fire Program Analysis – Preparedness Module

Source of Fire Resource Production Rates
White Paper v 2.3

Date: August 09, 2004

Topic: Source of Fire Resource Production Rates for the Preparedness Module

Issue: One "standard" does not exist for fire resource production rates for strategic initial response preparedness planning. Many agencies and bureaus have developed their own fire resource production rates for use within their initial response planning models. Agency specific production rates may not be the same as the National Wildfire Coordination Group's (NWCG) fire resource production rates.

Background: The National Fire and Aviation Executive Board (NFAEB) directed the Fire Program Analysis System – Preparedness Module (FPA-PM) Core Team to use existing NWCG Standards. Standard rates are one of the attributes for each fire resource that define the cost effective organization per point along the cost effective frontier. FPA-PM must have standard initial response production rates for fire resources to be evaluated as potential contributors to the mix of fire resources.

Changing the production rate of the same fire resource for the same Fire Behavior Prediction System (FBPS) surface fuel model resulted in a significant change in the output of Cost plus Net Value Change. A sensitivity study of the inputs for the Interagency Initial Attack Analysis (IIAA) concluded that fire resource production rates were one of the most sensitive inputs. FPA-PM is using Anderson's containment algorithm, the same used in IIAA. This suggests that fire resource production rates will also be a sensitive input for FPA-PM.

Process:

- FBPS surface fuel models and representative slope percents will be assigned to the Fire Management Unit (FMU) by the fire planner based upon their distribution within the FMU.
- A random draw will be utilized to determine which surface fuel model and slope percent will be used for each fire behavior calculation, (see Personnel Computer Historic Analysis Functional Requirements Document) for each fire event within the Fire Event Scenario.
- The FBPS surface fuel model with associated slope percent is then used to determine the appropriate production rate from the NWCG Standard Production Rate Table. This assignment will be by fire resource Kind, Category, Type and Staffing (KCTS). The staffing variable is not applicable to all fire resource KCTS.

- NWCG standard production rate tables provide additional delineation for some of the FBPS surface fuel models creating a "specific condition". Determining the specific condition for each surface fuel model based on the observed fire behavior and associated production rates of initial response fire resources within a FMU. There is significant difference in production rates for the same KCTS fire resource within the same surface fuel model dependant upon the specific condition selected per surface fuel model.
- The slope percent drawn for each fire event will be converted to the corresponding slope class that is selected during the random draw for the specific FMU.
- The fire planner will provide the representing FBPS surface fuel models and the associated specific condition for each FMU within their Fire Planning Unit (FPU).
- Once the FBPS surface fuel model and percent slope are drawn the NWCG standard production rate will be assigned based upon the Fire Resource KCTS.

The current NWCG standard production rate tables are published at the Fire Program Analysis System website http://fpa.nifc.gov. The production rates presented in these pages were obtained from the Fireline Handbook, NWCG Handbook 3 (PMS410-1, NFES #0065).

Fire Resources without Production Rate Values

For fire resources that are not listed in the Fireline Handbook, NWCG Handbook 3 by KCTS, Fire Planning Units (FPU) will submit a request to the FPA Implementation Coordinating Group (FPA ICG) requesting a new fire resource production rate for fire resources not listed in the Fireline Handbook. The FPU will complete the Fire Resource Production Rate Request Form and submit that to the FPA ICG so an interim production rate can be established for the unlisted KCTS.

The FPA ICG will submit the request for a new fire resource production rate to the NWCG IOS Working Team for their approved use for fire planning.
These new, interim fire resource production rates will be added to the existing fire resource production rate tables found in the Fireline Handbook, NWCG Handbook 3 (PMS410-1, NFES #0065).

Future Resources

The USDA Forest Service, San Dimas Technology and Development Center (SDTDC) are conducting a two-year study to examine methods for measuring and validating existing production rates. The study will also develop production rates for resources or activities not covered by the Fireline Handbook. When applicable, current production rates will be updated by the rates determined by the study. It is anticipated that initial study results will be available as early as September 2005.

Outcomes

The process outlined above will ensure that matching the production rate with the surface fuel model used for calculating the perimeter growth and rate of surface spread will be the same FBPS surface fuel model and percent slope.

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- For more information, see the FPA web site http://fpa.nifc.gov